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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/779,789	02/07/2001	Behrooz Rezvani	VELCP008X1C	7769
28436	7590	07/27/2004	EXAMINER	
IP CREATORS P. O. BOX 2789 CUPERTINO, CA 95015			AHN, SAM K	
			ART UNIT	PAPER NUMBER
			2634	
DATE MAILED: 07/27/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/779,789	Applicant(s) REZVANI ET AL.	
	Examiner Sam K. Ahn	Art Unit 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2001.  
2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-16 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 09 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>06252001, 07092001</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. IDS filed on 07/09/01 contains same references as the references filed on 06/25/01, and therefore were not acknowledged.

### ***Specification***

2. The abstract of the disclosure is objected to because it exceeds 150 words.  
Correction is required. See MPEP § 608.01(b).

### ***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the switch, recited in claim 7, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency.

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Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference character(s) mentioned in the description: **530 and 532 in Fig.5E**. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. Claims 1-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claims 1 and 12, lines 10-11 and 9-10, respectively, recite "... correlate delays between the leakage signal and *each of the reflected signals...*". Fig.5B-5D appears to illustrate the received signal where the correlator correlates the received signal. However, the specification does not further describe to reasonably convey to one skilled in the art as to how *each of the reflected signals* are correlated by the correlator. How does the correlator identify each of the reflected signals?

Regarding claim 6, it appears that the element of a "circular shift register" is 402 in Fig.4B, however, the claim recites wherein the register is coupled to the transmit path. Is this correct?

Claims 2-5, 7-11 and 13-16 directly depend on claim 1 or 12.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 6, line 3, recites wherein the "periodicity N greater in duration...".

However, it is unclear as to what has a periodicity N greater in duration.

*Assuming that the correlator correlates leakage signal and reflected signals, rather than each of the reflected signals, rejection is as below.*

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 7 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vareljian.

Regarding claims 1 and 12, Vareljian teaches a method and an apparatus for channel estimation of a communication device with a transmit path and a receive path both coupled to a communication medium (see Fig.4), and the apparatus comprising: a generator (148) coupled to the transmit path for periodically injecting a codeword signal into the transmit path which effects both a leakage signal on the receive path as well as reflected signals from various portions of the communication medium (note col.2, lines 26-41 and col.4, lines 54 - col.5, line 11 and see  $V_{rx} + V_e$  output from 126), an analog to digital converter coupled to the receive path to digitize a composite received signal including both the leakage signal and the reflected signals (138), and a correlator to correlate between the leakage signal and

reflected signals to estimate channel characteristics for the communication medium (130). (note col.4, line 24 – col.6, line 50) Although, Vareljian does not explicitly teach wherein the correlator processes in time domain to correlate delays, one skilled in the art would analyze that by having implementing a Fourier transform, one may convert between time domain and frequency domain. Therefore, by Fourier transforming the received signal, one may be able to analyze and correlate the received signal in time domain in Vareljian's system for the purpose of analyzing the channel estimation in time domain rather than in frequency domain.

Regarding claim 7, Vareljian teaches all subject matter claimed, as applied to claim 1. Vareljian further teaches a filter (120, 136 in Fig.4) on the receive path for reducing a power associated with the leakage signal on the receive path, and a switch (112(5) and 112(6)) operable to decouple the filter from the receive path during the injecting of the codeword to increase the power associated with the leakage signal on the receive path.

Regarding claim 9, Vareljian teaches all subject matter claimed, as applied to claim 1. Vareljian further teaches wherein the communication medium comprises one of a wired and an optical communication medium. (14, which is a telephone wire)

Regarding claims 10 and 11, Vareljian teaches all subject matter claimed, as applied to claim 1. Vareljian further teaches wherein the communication device comprises a

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physical modem or DSL modem, (see Fig.4) which implements at least one X-DSL communication protocol.

8. Claims 2-4 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vareljian in view of Langberg et al. (Langberg).

Regarding claims 2 and 13, Vareljian teaches all subject matter claimed, as applied to claim 1 or 12. Vareljian, as explained above, teaches training signal generator (148 in Fig.4) generating training signals, but does not explicitly teach that the codeword is a pseudo random sequence. Langberg teaches DSL modem transmitting a codeword in a pseudo random sequence (by 38 in Fig.4). Therefore, it would have been obvious to one skilled in the art at the time of the invention to implement generation of the codeword using a pseudo random sequence, as taught by Langberg for the purpose of taking advantage of a sequence which is randomly generated and making the system robust, as taught by Langberg (note col.8, lines 5-14).

Regarding claims 3 and 14, Vareljian teaches all subject matter claimed, as applied to claim 1 or 12. And further limitation of a pseudo random sequence is explained above. Although Vareljian in view of Langberg do not explicitly teach wherein the interval of pseudo randomness greater in duration than a return time associated with a selected one of the reflected signals reflected from a furthest selected portion of the communication medium, it would have been obvious to one



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skilled in the art at the time of the invention to implement as such, since sending another pseudo random sequence before receiving the already sent sequences may result in interfering with each other, thus creating interference which would hinder the system from properly estimating the communication channel.

Regarding claims 4 and 15, Vareljian teaches all subject matter claimed, as applied to claim 1 or 12. And further limitation of a pseudo random sequence is explained above, and Langberg further teaches wherein the sequence consists of binary 1 and binary  $-1$ . (note col.4, lines 16-25)

*Assuming that the circular shift register is coupled to a receive path, and assuming that the codeword has N periodicity,*

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vareljian in view of Mannermaa.

Regarding claim 6, Vareljian teaches all subject matter claimed, as applied to claim 1. And although Vaerljian does not explicitly disclose wherein the interval of codeword is greater in duration than a return time associated with a selected one of the reflected signals reflected from a furthest selected portion of the communication medium, it would have been obvious to one skilled in the art at the time of the invention to implement as such, since sending another pseudo random sequence before receiving the already sent sequences may result in interfering with each other, thus creating interference which would hinder the system from properly

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estimating the communication channel. However, Vaerljian does not explicitly teach wherein a circular shift register is coupled to a receive path. Mannermaa teaches correlation of received spread sequences wherein the correlator comprises a circular shift register (see 24 and 34 in Fig.1 and note col.5, lines 27-35). Therefore, it would have been obvious to one skilled in the art at the time of the invention to include the circular shift register of Mannermaa in the correlator of Vareljaian for the purpose of shifting the locally generated sequences and effectively correlate with the received composite received signal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Sam Ahn** whose telephone number is **(703) 305-0754**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Jay Patel**, can be reached at **(703) 308-7728**.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

P.O. Box 1450

Alexandria, VA 22313-1450

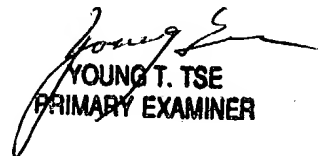
**or faxed to:**

**(703) 872-9306**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Sam K. Ahn  
7/22/04

  
**YOUNG T. TSE**  
**PRIMARY EXAMINER**